REMARKS

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of July 2, 2002. Reexamination and reconsideration are respectfully requested.

The Office Action

Claims 1-6, 8, 9 and 11-28 were presented for examination. The drawings objected to as the reference character "10" has been used to designate both chip and laser print bar (read page 21, line 7 of the instant invention).

Claim 5 stands rejected under 35 U.S.C. § 112, second paragraph. As it is considered, the term "substantially" is indefinite.

Claims 1-6, 8, 11, 17-22, 25 and 26 stand rejected as being unpatentable over Ogura et al. in view of Smith et al.

Claims 9, 12 and 13 stand rejected as being unpatentable over the combination of Ogura et al., Smith et al. and Yamazaki et al.

Claims 14 and 15 stand rejected under the combination of Ogura et al., Smith et al. and Sekiguchi.

Claim 16 stands rejected under the combination of Ogura et al., Smith et al. and Yamada et al.

Claims 23 and 24 stand rejected as being unpatentable over the combination of Ogura et al., Smith et al. and Rajeswaran.

Claims 27 and 28 were withdrawn from consideration as being directed to a non-elected invention.

The Non-Art Objections and Rejections

With attention to the rejection of the drawings, Applicants' statement that the amendment to the specification addressed the drawing objection was not persuasive as it was not believed the correction was shown in any of the amendments.

However, Applicants respectfully directs attention to the amendment of page 5, lines 5-6 in the previous response. which states:

Turning to FIGURE 1, illustrated is a section of a laser

printbar chip (also called in the following simply a printbar) **10** having individual lasers **12** interleaved at a 3 μm pitch spacing.

It is respectfully submitted this is the amendment pointed to by the Applicants as addressing the objection to the drawings. By this amendment, it is submitted the drawings are in proper form as it is noted the chip referred to may in one embodiment be a printbar chip.

Claim 5 stands rejected for its use of "substantially." Claim 5, as well as claim 4, have been amended to address this concern.

The Art Rejections

On September 26, Applicants held a telephonic interview with the Examiner.

Applicants gratefully acknowledge the opportunity to discuss the application and cited references.

In an interview summary, the Examiner noted "Applicant further explained the invention and presented arguments direct to the structure and material of sensor, specifically, the sensor . . . at least partially transparent to light at selected wavelengths. However, no agreement was reached. Examiner will fully consider the response as well as amendments responding to the final office action."

During the interview, there was a certain lack of clarity on Applicants part as to the Examiner's comments in the Office Action, which the Examiner clarified.

More particularly, and with specific attention to claim 1, the Office Action had pointed to FIGURES 10a and FIGURE 28 to teach the concepts of a sensor having an active layer and contacts where the active layer is configured to sense light (column 8, lines 37-45), and be at least partially transparent to light at selected wavelengths.

In reviewing FIGURE 10a, Applicants acknowledged this figure may initially be thought to teach a sensing concept as in the present application. However, upon further review, Applicants noted that the patent shows sensor 1 in more detail in FIGURES 6 and 7.

This design was discussed beginning in column 7, line 14, where it is noted the sensor of photosensor substrate 1 is simply a prior art sensor design where light passes through the photosensor substrate but did not pass through the sensor. Rather, the light illuminates an

image holding member (P), is reflected from the image holding member and is then received by the photoelectric conversion elements (column 4, lines 5-10).

Thus, Applicants argued in the previous Response that the "sensor" of Ogura et al. is designed only to sense reflected light.

During the interview, it became apparent that interpretation of what is the sensor differed between the Examiner and Applicants.

It is the Examiner's position that the sensor was everything shown in FIGURES 6 and 7 under the bracket "1". Therefore, light moving through what was defined as the sensor met the limitations of the claim. On the other hand, Applicants were interpreting sensor to mean those elements which "actively sensed" light.

Applicants now respectfully request the Examiner to reconsider the interpretation that everything in the bracket in FIGURES 6 and 7 connected to "1" is a sensor.

In column 7 of the Ogura et al. patent, beginning at line 4, it is recited that "1" is the "photosensor substrate." Thus, it is Applicants' understanding that light passing through the "photosensor substrate" is not the sensor. Rather, the sensor is the light-shielding layer (201), the insulating layer (202), an i-type semiconductor layer (203), an n+-type ohmic contact layer (204), a main electrode (205), a passivation layer (206) and an adhesive layer (207). Thus, what is disclosed as the sensor is not designed to be transparent in any situation. Particularly, the sensor includes light-shielding layer 201. Therefore, rather than teaching a transparent feature such as set forth in the claims, this language specifically teaches away from a transparent-type sensor. Such a design requires Ogura et al. to use reflected light as opposed to the use of a direct light design which is possible due to the structural design claimed in claim 1, for example.

With continuing attention to claim 1, after further reviewing the claim language, it is submitted this language distinguishes over Ogura et al. even if an argument is made that the light through the photosensor substrate 1 is passing through the "sensor." Particularly, claim 1 includes a structure of a sensor "including an active layer and contacts, said active layer configured to sense light and be at least partially transparent to light at selected wavelengths." Applicants have amended this language to include "be" to read more clearly.

However, the concept as originally presented in this clause is that the active layer is configured to sense light and be partially transparent to light at selected wavelengths. Again,

even if it is argued that 1 is the photosensor substrate in FIGURES 6 and 7 of Ogura et al. is a sensor, the portion the light is passing through is not the "active layer." It is noted the "partially transparent language" is an acknowledgment that there is not a hundred percent passage of the light, but some is absorbed by the active layer.

For this reason, it is respectfully submitted independent claim 1 is distinguished.

Dependent claims 4 and 5 are amended to address the stated § 112 concerns.

Dependent claims 9 and 11 have been amended simply for formal reasons, and not to alter the scope of the claims.

Turning to independent claim 17, the discussion in connection with claim 1 is equally applicable here. Particularly, in this claim the sensor is defined as "including an active layer." Therefore, when it is stated that the substrate and sensor are at least partially transparent to light, this inherently includes the active layer. However, to provide this in a more clear statement, this claim has been amended to restate that the sensor includes the active layer.

Claim 17 has also been amended to recite the structure of the elements are aligned where at least a portion of the light "directly" emitted by the at least one of the laser and LED is directed through a portion of the substrate and the sensor (again the sensor includes the active layer). By this amendment, it is clarified that the light from the light source is not reflected to the sensor as shown in Ogura et al., but rather is provided to the sensor directly.

As noted in the application, this is a beneficial aspect, as it permits a more compact device, and for calibration of the printing system to occur *in situ*.

Turning to independent claim 22, this claim is amended to emphasize that the light from the light source is directly sensed and passed through the sensor.

Turning to independent claim 26, this claim has also been amended to verify that the structure of the hybrid device is configured so that light emitted from the light source is directly provided to and through the sensor.

For the foregoing reasons, it is respectfully submitted independent claims 1, 17, 22 and 26 are distinguished from the art.

As the corresponding dependent claims further define these claims, it is submitted claims depending therefrom are also distinguished.

CONCLUSION

For the reasons detailed above, it is respectfully submitted that the present patent application is now in condition for allowance. An early notice to that effect is earnestly solicited. The foregoing amendments have not required additional search or consideration by the Examiner.

Respectfully submitted,

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Attachment: Version With Markings To Show Changes Made

CERTIFICATE OF MAILING

I hereby certify that this Amendment After Final is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner of Patents and Trademarks, Washington, D.C. 20231, on **November 1, 2002**.

By _____
Karen M. Forsyth

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims

Please cancel claims 27 and 28.

Please amended claims 1, 4, 5, 9, 11, 17, 22 and 26 as follows:

1. (Three Times Amended) A hybrid device comprising:

a substrate;

a micro-spring interconnect formed on the substrate, the micro-spring interconnect including,

an elastic material that is operatively associated with a surface of the substrate including,

an anchor portion fixed to the substrate, and

a free portion spaced from the substrate; and

a sensor formed on the substrate, the sensor including an active layer and contacts, said active layer configured to sense light and be at least partially transparent to light at selected wavelengths,

said micro-spring interconnect and said sensor being integrated on the substrate.

4. (Twice Amended) The invention according to claim 2 wherein the sensor, including the active layer, is designed and aligned with at least one of the laser array and the LED array to receive and pass, through the active layer, [substantially all of] an amount of the emitted light from a portion of at least one of the laser array and the LED array sufficient for a printing operation.

5. (Twice Amended) The invention according to claim 4 wherein the substrate is designed and aligned with at least one of the laser array and the LED array to receive and pass, through the active layer, [substantially all] an amount of the emitted light from a

portion of at least one of the laser array and the LED array sufficient for a printing operation.

9. (Amended) The invention according to claim 1 wherein the sensor is comprised of,

a first transparent/conductive layer;

[an] the active layer located on top of the first transparent/conductive layer;

a second transparent/conductive layer on top of the active layer;

a passivation/release layer located over at least the first transparent/conductive layer and the second transparent/conductive layer;

vias through the transparent/conductive layers; and

a metal layer connecting to the first and second transparent/conductive layers through the vias, wherein the metal layer acts as signal lines to receive and carry signals from the active layer.

11. (Three Times Amended) The invention according to claim [10] 1 wherein the elastic material is a stressed metal layer having sub-layers of differing stress gradients.

17. (Twice Amended) A hybrid device comprising:

at least one of a laser or LED device capable of emitting light at a certain wavelength;

a substrate;

a micro-spring interconnect formed on the substrate, the micro-spring interconnect including,

an elastic material operatively associated with a surface of the substrate including,

an anchor portion fixed to the substrate, and

a free portion spaced from the substrate; and

a sensor formed on the substrate, in an integrated manner, with the micro-spring interconnect, the sensor including an active layer and contacts, wherein said substrate[,] and said sensor, including the active layer, are at least partially transparent to light at the wavelength emitted by at least one of the laser or the LED

device; and

said at least one of the laser or the LED device and said substrate with said sensor and said at least one micro-spring interconnect being separately fabricated and aligned, such that at least a portion of the light emitted directly by the at least one of the laser and LED device is directed through at least a portion of the substrate and the active layer of the sensor.

22. (Three Times Amended) A calibration/printing system comprising:

a sensor configuration including a sensor element integrated on a substrate with a plurality of micro-spring interconnects;

a light source aligned with the sensor configuration such that at least a portion of the light directly from the light source is sensed [by] and passed through the active layer of the sensor and at least a first of the micro-spring interconnects is in physical contact with a portion of the light source; and

a driver chip aligned with the sensor configuration and the light source such that at least a second of the micro-spring interconnects is in physical contact with a portion of the driver chip, and a communication path is formed between the light source and the driver chip by the at least first and second micro-spring interconnects.

26. (Three Times Amended) A hybrid device comprising:

a micro-spring interconnect structure; and

at least two devices electrically connected by the interconnect structure wherein,

one of the devices is a sensor, the sensor including an active layer and contacts, said active layer sensing light, and

another one of the devices is at least one of a single light source, an array of lasers, and an array of light emitting diodes (LEDs), positioned to emit light directly to and at least partially through the active layer of the sensor.